

EFFECT OF ROPE SKIPPING, SPOT RUNNING, AND STEP-UPS ON CARDIO-VASCULAR ENDURANCE OF COLLEGE BOYS

RAJ KUMAR AND YUVRAJ SINGH

Assistant Professor, Department of Physical Education, R. V. Higher Education & Technical Institute, Dadri, G. B. Nagar.

Assistant Professor, Department of Physical Education, Lovely Professional University, Phagwara, Punjab.

Abstract:

Purpose: The purpose of this study was to investigate effect of rope skipping, spot running, and step-ups on cardio-vascular endurance of college boys. Methods: For the purpose of this study 40 boys as subjects from V. S. S. D. P. G. College, Kanpur, were selected at random. Their age ranged from 18 to 22 years. All the subjects were randomly assigned to three experimental groups (A, B and C) and one control group (D) each consisting of 10 subjects. The experimental treatments were also assigned to the groups at random. The groups A, B and C were treated as experimental groups and were administered progressive training programme of rope skipping, spot running and step-ups respectively for six weeks. The group 'D' served as control group and continued attending the college but did not participate in any kind of training programme. Modified Harvard Step test was administered at the beginning and after the experimental period of six weeks in terms of pre-test and post-test scores on the criterion measures. To find out the effect of rope skipping, spot-running and step-ups on cardio-vascular endurance of college boys, the analysis of co-variance was used as the statistical treatment. The level of significance was set at 0.05 level. Results: The result of the study revealed there was significant effect of rope skipping, spot running, and step-ups on cardio-vascular endurance of college boys. Conclusions: In the light of the findings, it was concluded that a training of six weeks rope skipping, spot running, and step-ups was sufficient to have a significant difference in cardio vascular endurance of boys.

KEYWORDS:

rope skipping, spot running, step-ups and cardio vascular endurance.

INTRODUCTION

Wilson (1969), Modern day physical education is concerned with the development of the individual to as hears the innate motor potentialities as possible. Many physical educators also consider the development of desired characteristics of individual personality structure as an important outcome of physical education. Since the degree of motor ability and extent of personality development are desired outcome of physical education, the relationship of selected factors of personality to levels of motor ability should be great importance to the profession. Physical education is that part of education which deals with big muscle activities and their related response. These activities are selected to provide an environment conducive to human and growth and development and create behavior patterns which in turn, contribute to the shaping of a better citizen .Physical education activity has the potential of playing and important role in the development and maintenance of human body and in assenting the mental., social and moral development. Bucher has pointed out that physical education is one phases of the total educational process and that it utilizes activity drives that one inherent in each individual in order to develop organically. These education activities are conducted in places. Such as the playground, gymnasium, track and swimming pools. Today, more than ever before, it is necessary for the physical educator and coach to recognize the vital part science plays in the successful conduct of physical education and athletic programmers. To

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contribute to the best of one's ability to all aspects of physical education and athletics will require good understanding of the available scientific knowledge. Not only will such understanding result in better teams and better programme of activities but it will also enable to guard the health of pupils. Then too, knowing the reasons why to select particular training programme for accomplishing a scientific task, scientific knowledge is essential. In the modern scientific age, in every field of human endeavor, systematic objectives and scientific procedures must be followed in accordance with principles based on exercise, understanding and application of knowledge of science. The field of games and sports is an exception to this. In the field of sports, training means preparing sportsmen for a highest level of performance sports training is the physical, technical, intellectual, psychological and moral preparation of an athlete by means of physical exercises i.e. by applying work load." The word "training" has been a part of human language since ancient times. It denotes the process of preparation for some task. This process invariable extends to number of days and even months and years. Sports by their very nature are challenging and enjoyable primitive men received most of the exercise through the ordinary daily pursuits that were necessary for them to earn a livelihood. They engaged in activities of a war like nature, and in time of peace, practiced those skills as a recreational past times. In sports and games conditioning and training play a vital role in the improvement level. Therefore, specialized training in sports and games had become a necessary of superior performance. Regular training with out having any break is always emphasized as an essential ingredient for the athletes. One of the basic laws of biology is that the fundamental efficiency of an organism improves when it is used and regressed with disuse. Accordingly it follows that if the human machine is to be kept in good working order some regular exercise is necessary.

PROBLEM

The problem undertaken was to compare the effect of rope skipping, spot running and step-ups on cardio-vascular endurance of college boys.

SIGNIFICANCE OF THE PROBLEM

1. The result of this study will highlight the qualitative effect of rope skipping, spot running, and step-ups training for a period of 6 weeks on cardio-vascular endurance.
2. The result of this study will be of immense help to the physical education teachers and coaches to frame or modify the existing schedules of training.
3. The result of this study will be helpful to the people who are interested in developing the physical fitness of their trainees by various exercise programs of their choice.
4. The result will be further helpful to those people who have very less infrastructure of other facilities available to them for developing physical fitness with the simple and easy available means of exercise.

LIMITATIONS

The difference in performance due to lack of motivation was identified as a limitation of this study.

1. If any of the subjects in case of highly motivated individuals with the desire to perform better the other, was not be better or asses.
2. No special motivation technique was used to encourage the subject.
3. The interest and motivation of the subjects to participate in the training was also a limiting factor.
4. The diet and daily routine of individual was also one of the limitations.

METHODOLOGY

For the purpose of this study 40 boys from V. S. S. D. P. G. College, Kanpur, were selected at random as subjects. Subjects' age ranged from 18 to 22 years. All the subjects were randomly assigned to three experimental groups (A, B and C) and one control group (D) each consisting of 10 subjects. The experimental treatments were also assigned to the groups at random. The groups A, B and C were treated as experimental groups and were administered progressive training programme of rope skipping, spot running and step-ups respectively for six weeks. The group 'D' served as control group and continued attending the college but did not participate in any kind of training programme. Hence, the study conducted was of the random group design. Modified Harvard Step test was administered at the beginning and after the experimental period of six weeks in terms of pre-test and post-test scores on the criterion measures.

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STATISTICAL PROCEDURE

To find out the effect of rope skipping, spot-running and step-ups on cardio-vascular endurance of college boys, the analysis of co-variance was used as the statistical treatment. The level of significance was set at 0.05 level.

RESULTS

The differences between the initial and final scores in cardiovascular endurance were subjected to statistical treatment using Analysis of Covariance (ANCOVA) to find out whether the mean differences were significant or not.

Table I
Analysis of Variance of Comparison of Means of Experimental Group and Control Group in Cardio Vascular Endurance

	Group				S. V.	df	S. S	M S	F
	Rope skipping	Spot Running	Step UPS	Control					
Pre test	53.2	57.7	54.0	52.5	B	3	234.8	78.3	2.50
					W	36	1140.4	31.7	
Post test	59.2	67.8	67.2	57.5	B	3	861.1	287.0	10.70*
					W	36	962.5	26.7	
Adjusted test	60.7	65.6	67.1	58.2	B	3	477.2	159.1	9.60*
					W	35	580.2	16.6	

*Significant at the level of 0.05. $F_{(3,36)} = 2.87$ & $F_{(3,35)} = 2.87$.

Table I shows that the analysis of Co-variance between the mean scores of experimental (rope skipping, spot running and step-ups) and control groups on Cardio vascular endurance measure respectively. It was reported significant difference (10.70*) between the mean scores of post-test of control and experimental groups (rope skipping, spot running and step-ups), whereas no significant difference (2.50) between the mean scores of pre-test of control and experimental groups (rope skipping, spot running and step-ups) was found. With respect to Adjusted Post Test Means (APTMs) of control (mean = 58.2), experimental A (mean = 60.7), experimental B (mean = 65.6), experimental C (mean = 67.1) groups, significant difference (F-ratio=9.60*) was quite evident.

Since significant improvements were recorded, the results were subjected to post hoc analysis using LSD test. The results were presented in Table II.

The post hoc analysis of obtained ordered adjusted means proved that there was significant differences existed between control group and step up group; control group and spot running group and step ups and rope skipping.

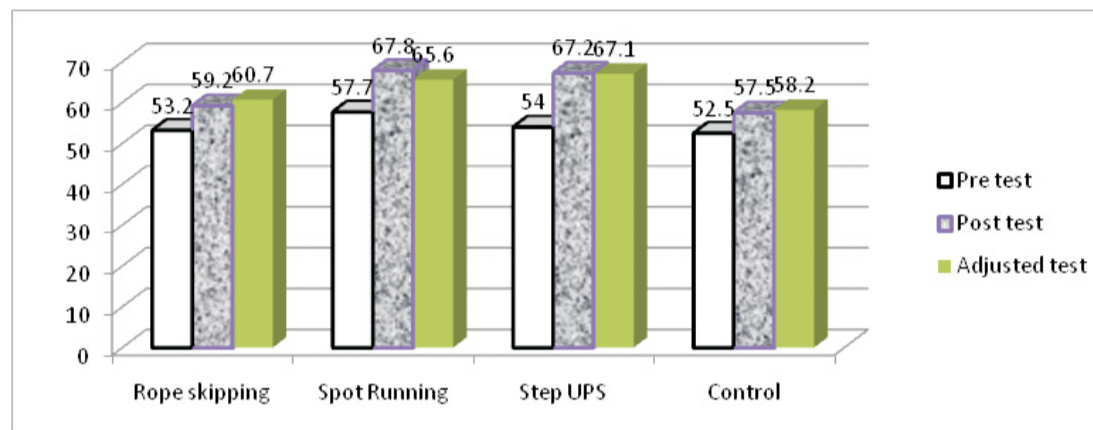
Table II
Least Significant Difference Test for Mean Difference between Groups for Cardio Vascular Endurance

MEANS					C. D
Control Group	Step ups	Spot Running	Rope Skipping	Mean Difference	
58.2	67.1			8.9*	5.3
58.2		65.6		7.3*	
58.2			60.7	2.4	
	67.1	65.6		1.5	
	67.1		60.7	6.4*	

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The above table reveals that significant difference exist between the means of Control & Steps ups group, Control & Spot running group, Step Ups & Rope Skipping group and insignificant difference exist between the means of Control & Rope Skipping and Step Ups & Spot running group.

Graph: 1 Shows the mean difference between pre-test, post-test and adjusted post test of control and experimental groups on Cardio vascular endurance



DISCUSSION

From the Table I, it can be ascertained that, obtained F value (9.60) was greater than the required F (2.87) to be significant at 0.05 level. Hence the data were further subjected to post hoc analysis using least significance difference test. The post test analysis found significant F value of 10.70, which was significant at 0.05 level. The post hoc analysis of obtained ordered adjusted means proved that there was significant differences existed between control group and step up group; control group and spot running group, and step ups and rope skipping with mean differences of 8.9, 7.3 and 6.4 against the required confidence interval value of 5.3. These differences were found significant at 0.05 level. Thus there existed no significant differences due to spot running, step up exercises. However there was no significant difference found due to rope skipping as the obtained mean value was less than the required confidence interval value to be significant at 0.05 level. Bernardi, Radaelli, Passino and Falcone et al. (2004) conducted a study on "Effects of physical training on cardiovascular control after heart transplantation." Exercise performance in heart-transplanted patients increases with respect to pre-transplantation but remains subnormal, and it does not improve with time after surgery. Possible causes include persisting denervation, and sympathetic vasoconstriction inducing functional vascular abnormalities that prevent adequate increase in blood flow to the exercising limbs. We tested the effects of physical training on baroreceptors-mediated control of heart rate and blood pressure in recently heart-transplanted subjects. Patients were randomly allocated to physical training (n=13, 30 min cycling at 60-70% of peak oxygen consumption for 5 days/week for 6 months) or to control (n=11). Upright exercise test to exhaustion was performed at the beginning of the study after 3 and 6 months. Reflex changes in RR interval and blood pressure in response to sinusoidal neck suction (6 and 12 cycles/min 0 to -30 mm Hg swing) were considered as evidence of reinnervation and baroreflex control of blood pressure, respectively. After 6 months peak oxygen consumption (p<0.001), exercise time (p<0.01) and workload (p<0.01) increased in trained patients. Before training RR interval and blood pressure were not modified by neck suction. After physical training systolic (p<0.01) and diastolic blood pressure decreased, RR interval and blood pressure could be modulated (p<0.05) by slow (6 cycles/min) neck suction, indicating initial cardiac sympathetic reinnervation and restored sensitivity to autonomic modulation on the arteries. No changes were observed in controls. Physical training improved exercise performance and the control exerted by the autonomic nervous system through the sympathetic nerves at both cardiac and vascular level.

CONCLUSION

Within the limitations of this study, the following conclusions were drawn.
 1. Spot running significantly improved cardio vascular endurance comparing to control group.

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2. Step up significantly improved cardio vascular endurance comparing to control group.
3. Rope skipping failed to improve cardio vascular endurance significantly comparing to control group.

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